

FORM PTO-1390 (Modified)
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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

TRANSMITTAL LETTER TO THE UNITED STATES

217092US

DESIGNATED/ELECTED OFFICE (DO/EO/US)

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

CONCERNING A FILING UNDER 35 U.S.C. 371

09/926774

INTERNATIONAL APPLICATION NO.

INTERNATIONAL FILING DATE

PRIORITY DATE CLAIMED

PCT/CH99/00268

18 JUNE 1999

NONE

TITLE OF INVENTION

METHOD, DEVICE AND SYSTEM FOR CAPTURING AND PROCESSING VIEWING DATA

APPLICANT(S) FOR DO/EO/US

Rudolf RITTER, et al

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
 - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☒ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☒ is attached hereto.
 - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
10. ☒ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☒ A copy of the International Search Report (PCT/ISA/210).

Items 13 to 20 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
20. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
21. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
22. ☐ Certificate of Mailing by Express Mail
23. ☒ Other items or information:

Notice for Consideration of Documents Cited in International Search Report

Drawing (1 sheet),

Amended Sheets 1, 2, 2a, 9 and 10

| | | |
|--|--|---|
| U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 09/926774) | INTERNATIONAL APPLICATION NO. PCT/CH99/00268 | ATTORNEY'S DOCKET NUMBER 217092US |
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24. The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

- ☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO **\$1040.00**
- ☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **\$890.00**
- ☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **\$740.00**
- ☐ International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) **\$710.00**
- ☐ International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) **\$100.00**

ENTER APPROPRIATE BASIC FEE AMOUNT =**CALCULATIONS PTO USE ONLY****\$890.00**

Surcharge of **\$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).

\$0.00

| CLAIMS | NUMBER FILED | NUMBER EXTRA | RATE |
|--|--------------|--------------|--------------------------|
| Total claims | 14 - 20 = | 0 | x \$18.00 |
| Independent claims | 2 - 3 = | 0 | x \$80.00 |
| Multiple Dependent Claims (check if applicable). | | | <input type="checkbox"/> |

\$0.00**TOTAL OF ABOVE CALCULATIONS =****\$890.00**

Applicant claims small entity status. See 37 CFR 1.27). The fees indicated above are reduced by 1/2.

\$0.00**SUBTOTAL =****\$890.00**

Processing fee of **\$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).

\$0.00**TOTAL NATIONAL FEE =****\$890.00**

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable).

☐**\$0.00****TOTAL FEES ENCLOSED =****\$890.00****Amount to be:**

\$

refunded**charged**

\$

- a. ☒ A check in the amount of **\$890.00** to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. _____ in the amount of _____ to cover the above fees. A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **15-0030**. A duplicate copy of this sheet is enclosed.
- d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

703-413-3000
703-412-2220

Surinder Sachar
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SIGNATURE

Marvin J. Spivak

NAME

24,913

REGISTRATION NUMBER

DATE

Dec. 18 2001

217092US

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF: :

RUDOLF RITTER ET AL. :

SERIAL NO: NEW U.S. PCT APPLN. : ATTN: APPLICATION BRANCH
(Based on PCT/CH99/00268)

FILED: HERewith :

FOR: METHOD, DEVICE AND SYSTEM FOR
CAPTURING AND PROCESSING
VIEWING DATA

PRELIMINARY AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

Prior to a first examination on the merits, please amend the above-identified
application as follows:

IN THE CLAIMS

Please amend the claims as shown in the marked-up copy attached to read as follows:

1. (Amended) A method for capturing and processing viewing data, which viewing
data relate to the viewing behavior of users when viewing video data and which viewing data
are transmitted via a telecommunications network to a central unit, where they are further
processed, wherein

the video data are projected directly on the retina of the user by means of a virtual
retinal display device,

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during projecting of the video data, data about lines of sight of the user relative to the viewed video data are determined by determining current eye positions of the user by means of an eye position detection module of the display device, and

the viewing data are transmitted to the central unit with at least the data on the lines of sight.

2. (Original) The method according to claim 1, wherein the current eye positions is are compared with predefined values, and predefined actions are triggered on the basis of the result of this comparison.

3. (Amended) The method according to claim 1, wherein the viewing data are stored in the said central unit.

4. (Amended) The method according to claim 1, wherein the viewing data include user identification data.

5. (Amended) The method according to claim 1, wherein the viewing data include video identification data.

6. (Amended) The method according to claim 1, wherein the viewing data include time indications.

7. (Amended) The method according to claim 1, wherein the telecommunications network is a mobile radio network.

8. (Amended) A device for capturing and processing viewing data, which viewing data relate to the viewing behavior of users when viewing video data, which video data are reproduced by means of a display device of the device, the device including a feedback module, which feedback module transmits the viewing data to an evaluation unit, wherein the display device is a virtual retinal display device which projects the video data directly on the retina of the user,

the virtual retinal display device includes an eye position detection module, which, during projection of the video data, determines data on lines of sight of the user relative to the viewed video information by determining current eye positions of the user, and

the feedback module is set up such that it transmits the viewing data to the evaluation unit at least with the data on the lines of sight.

9. (Amended) The device according to claim 8, wherein the feedback module is set up such that it transmits the viewing data via a telecommunications network to a central unit.

10. (Amended) The device according to claim 8, wherein the device includes means of comparing the current eye positions with predefined values, and of triggering predefined actions on the basis of the result of this comparison.

11. (Amended) The device according to claim 8, wherein the device includes an identification module, assigned to the user, with user identification data, and the viewing data include the user identification data.

12. (Amended) The device according to claim 8, wherein the device includes a video identification module, which video identification module determines video identification data associated with the video data, and the viewing data include the video identification data.

13. (Amended) The device according to claim 8, wherein the device includes a time determining module which determines the current time, and the viewing data include time indications.

14. (Amended) The device according to claim 9, wherein the device is designed as a mobile device, and the telecommunications network is a mobile radio network via which mobile radio network the device is able to communicate.

IN THE ABSTRACT

Please amend the Abstract on page 12 as shown in the attached marked-up copy to read as follows:

ABSTRACT

Method, device and system for capturing and processing viewing data, which viewing data relates to the viewing behavior of users when viewing video data. Data about lines of sight of a user relative to the viewed video data are determined by projecting video data directly on the retina of the user and current eye positions of the user being thereby determined, which are transmitted by a telecommunications network to a central unit for further processing. In the further processing current eye positions are compared with predefined values, and predefined actions are triggered on the basis of the result of this comparison and/or the viewing data being stored in the central unit, and, for example later, being evaluated statistically.

REMARKS

Favorable consideration of this application, as presently amended, is respectfully requested.

The present preliminary amendment is submitted to place the above-identified application in more proper format under United States practice. By the present preliminary amendment the claims are amended to no longer recite any reference numerals or improper multiple dependencies. The Abstract is also amended to be in more proper format under United States practice.

The present application is believed to be in condition for a full and thorough examination on the merits. An early and favorable consideration of the present application is hereby respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



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| Marked-Up Copy Serial No: Amendment Filed on: <u>12-18-01</u> |
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IN THE CLAIMS

Please amend the claims as follows:

--1. (Amended) A method for capturing and processing viewing data, which viewing data relate to the viewing behavior of users when viewing video data and which viewing data are transmitted via a telecommunications network [(3)] to a central unit [(2)], where they are further processed, wherein

the video data are projected directly on the retina [(51)] of the user by means of a virtual retinal display device [(41)],

during projecting of the video data, data about lines of sight of the user relative to the viewed video data are determined by determining current eye positions of the user by means of an eye position detection module [(411)] of the display device [(41)], and

the viewing data are transmitted to the central unit [(2)] with at least the data on the lines of sight.

2. (Original) The method according to claim 1, wherein the current eye positions is are compared with predefined values, and predefined actions are triggered on the basis of the result of this comparison.

3. (Amended) The method according to [one of the claims 1 or 2] claim 1, wherein the viewing data are stored in the said central unit [(2)].

4. (Amended) The method according to [one of the claims 1 to 3] claim 1, wherein the viewing data include user identification data.

5. (Amended) The method according to [one of the claims 1 to 4] claim 1, wherein the viewing data include video identification data.

6. (Amended) The method according to [one of the claims 1 to 5] claim 1, wherein the viewing data include time indications.

7. (Amended) The method according to [one of the claims 1 to 6] claim 1, wherein the telecommunications network [(3)] is a mobile radio network.

8. (Amended) A device [(4)] for capturing and processing viewing data, which viewing data relate to the viewing behavior of users when viewing video data, which video data are reproduced by means of a display device [(41)] of the device [(4)], the device [(4)] including a feedback module [(42)], which feedback module [(42)] transmits the viewing data to an evaluation unit [(2, 44)], wherein

the display device [(41)] is a virtual retinal display device which projects the video data directly on the retina [(51)] of the user,

the virtual retinal display device [(41)] includes an eye position detection module [(411)], which, during projection of the video data, determines data on lines of sight of the user relative to the viewed video information by determining current eye positions of the user, and

the feedback module [(42)] is set up such that it transmits the viewing data to the evaluation unit [(2, 44)] at least with the data on the lines of sight.

9. (Amended) The device [(4)] according to claim 8, wherein the feedback module [(43)] is set up such that it transmits the viewing data via a telecommunications network [(3)] to a central unit [(2)].

10. (Amended) The device [(4)] according to [one of the claims 8 or 9] claim 8, wherein the device [(4)] includes means [(44)] of comparing the current eye positions with predefined values, and of triggering predefined actions on the basis of the result of this comparison.

11. (Amended) The device [(4)] according to [one of the claims 8 to 10] claim 8, wherein the device [(4)] includes an identification module [(45)], assigned to the user, with user identification data, and the viewing data include the user identification data.

12. (Amended) The device [(4)] according to [one of the claims 8 to 11] claim 8, wherein the device [(4)] includes a video identification module [(46)], which video identification module [(46)] determines video identification data associated with the video data, and the viewing data include the video identification data.

13. (Amended) The device [(4)] according to [one of the claims 8 to 12] claim 8, wherein the device [(4)] includes a time determining module [(43)] which determines the current time, and the viewing data include time indications.

14. (Amended) The device [(4)] according to [one of the claims 19 <sic. 9> to 13] claim 9, wherein the device [(4)] is designed as a mobile device, and the telecommunications network [(3)] is a mobile radio network via which mobile radio network [(3)] the device [(4)] is able to communicate.--

IN THE ABSTRACT

Please amend the Abstract as follows:

--ABSTRACT

Method, device [(4)] and system [(1)] for capturing and processing viewing data, which viewing data [relate] relates to the viewing behavior of users when viewing video data[, data]. Data about lines of sight of a user relative to the viewed video data [being] are determined by projecting video data directly on the retina [(51)] of the user and current eye positions of the user being thereby determined, which are transmitted [via] by a telecommunications network [(3)] to a central unit [(2)] for further processing. [The] In the further processing [consists in] current eye positions [being] are compared with predefined values, and predefined actions [being] are triggered on the basis of the result of this comparison and/or [said] the viewing data being stored in the central unit [(2)], and, for example later, being evaluated statistically.

[(sole figure)].--

ART 34 AMNT

1 / PARTS

09/926774

J007 Rec'd PCT/PTO 1 8 DEC 2001

**Method, Device for Capturing Data about the Viewing of Video Data, and
the Passing On of these Data to a Central Data Processing Facility**

This invention relates to a method and a device for capturing and processing of viewing data. In particular, this invention relates to a method and a device for capturing and processing of viewing data that concern the viewing behavior of users when viewing video data.

The viewing behavior of television viewers is statistically recorded and evaluated today, particularly for marketing purposes, on the one hand to find out which programs, or respectively which channels, are watched by whom and how often, and on the other hand to obtain a qualitative assessment from registered television viewers of the program watched. A mobile data logging device which, for purposes of market research, monitors and logs the use of a television set by a user has been described in the patent application WO 94/15417 A. Conventional data logging devices and methods are not suitable, however, for capturing the viewing behavior of users on the picture level, i.e. to record statistically the viewing behavior of individuals and/or groups when viewing concrete moving and/or still video data.

Described in the patent application WO 90/02453 is a system and a method for monitoring television viewers. According to WO 90/02453, light beams that are reflected by the eyes of a viewer, located within a defined visual range in front of a television set, are registered by means of a suitable receiver, which is positioned on the television set, for example. In the receiver it is determined on the basis of the registered reflected light beams whether the respective viewer is looking at the television screen. According to WO 90/02453, data about the viewing time and the selected television channel are stored and are transmitted via the telephone network to a central unit. The system according to WO 90/02453 is limited to the registration of a viewer within a defined visual range, and can only detect whether the screen is being looked at by the viewer; thus no indications about picture regions or picture objects, looked at by the viewer on the television screen, are possible.

It is an object of this invention to propose a new and better method, a new and better device as well as a new and better system for capturing and processing viewing data that make it possible to capture the viewing behavior

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of users when viewing video data.

This object is achieved according to the invention in particular through the elements of the independent claims. Further advantageous embodiments follow moreover from the dependent claims and from the description.

5 This object is achieved through the present invention in particular in that when viewing video data, for example still or moving pictures from transmitted television programs, reproduced, stored video sequences, pictures or graphics, data about lines of sight of a user relative to the viewed video data are determined in that the video data are projected through a virtual retinal display
10 device directly onto the retina of the user and current eye positions of the user are determined, and the viewing data, which contain at least these data about lines of sight, are transmitted to an evaluation unit, for instance to a central unit via a telecommunications network. This has the advantage that lines of sight of a user relative to viewed video data can be determined without it being thereby
15 necessary to also take into account horizontal or vertical head movements of the user. Made possible moreover is for viewing data about users' viewing habits when watching video data to be captured centrally, in particular data about which picture segments of reproduced video data are looked at. The recorded viewing data are then available in the central unit for further
20 evaluation; they can also be used, however, for starting and/or controlling interactive processes, particularly on the level of individual users, such as dialogues for surveys or product orders, for instance.

In a preferred embodiment variant, current eye positions are compared with predefined values, for instance in the device with the display or in the
25 central unit, and, on the basis of the result of this comparison, predefined actions are triggered, for instance in the device with the display or in the central unit, e.g. order procedures or the transmission of information, in particular video data. This has the advantage that graphic user interfaces can thereby be achieved which can be controlled by the user, without using his hands, through
30 positioning of his eyes.

In an embodiment variant, the viewing data transmitted to the central unit include user identification data, which originate for instance from identification

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modules, e.g. from SIM cards (Subscriber Identification Module), that are each assigned to the users. This makes it possible for evaluation and use of captured viewing data to be carried out on the level of individual users, as described above, or for additional known information about respective users to
5 be taken into consideration in the evaluation and further use of captured viewing data.

In an embodiment variant, the viewing data transmitted to the central unit include video identification data. This is especially advantageous when the source of the video data and the central unit for capturing the viewing data are
10 not implemented together, so that captured viewing data can be associated with the respective video data during their evaluation and further processing.

In an embodiment variant, the viewing data transmitted to the central unit include time indications. Depending upon the type of video data, for instance in the case of transmission of video data by television program, time indications
15 can be used to assign captured viewing data to the respective video data, for their evaluation and further use.

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The captured and transmitted viewing data are preferably stored in the central unit, for example in a viewing database, whereby the viewing data can also be made available at later points in time, in particular for statistical evaluations.

5 In an embodiment variant, the above-mentioned telecommunications network is a mobile radio network, for example a GSM or UMTS network or another, for instance satellite-based, mobile radio network. This has the advantage that the capturing of individual viewing data when viewing video data can be carried out in a mobile way, independently of fixed network
10 connections.

An embodiment of the present invention will be described in the following with reference to an example. The example of the embodiment is illustrated by the following sole attached figure:

Figure 1 shows a block diagram of the system, which block diagram
15 presents schematically a central unit that is connected, via a telecommunications network, to a device, in particular a communications terminal, which communications terminal comprises a video display device that projects video data onto the retina of an eye and which includes an eye position detection module that determines current eye positions of a user.

20 Reference numeral 4 in Figure 1 refers to a device, in particular a communications terminal, for example a fixed-installed communications terminal 4, e.g. a telephone or a communication-capable personal computer that is able to exchange data with a central unit 2, over a fixed network 3, for example a public switched telephone network, an ISDN network (Integrated
25 Services Digital Network), an IP-based network (Internet Protocol), or a WAN (Wide Area Network) or LAN (Local Area Network), or a mobile communications terminal 4, i.e. a mobile device 4, for example a mobile radio telephone or a communication-capable laptop or palmtop computer, which is able to exchange data with a central unit 2 via a mobile radio network, for
30 instance a GSM or UMTS network, or another, for instance satellite-based, mobile radio network, for example with the aid of SMS messages (Short Message Services), USSD messages (Unstructured Supplementary Services Data), GPRS services (Generalized Packet Radio Service), or according to another suitable protocol, via the user information channel.

The central unit 2 is based, for example, on a commercially available communications server having a communications module 21 with the necessary hardware and software components to communicate with the communications terminals 4 via the telecommunications network 3. The central unit 2 is directly connected to the telecommunications network 3, or is connected via suitable network elements, for instance a Mobile Switching Station (MSC), and includes a database 24 that is implemented on the same, or on a separate, computer.

As shown in Figure 1, the communications terminal 4 includes a video display device 41 which reproduces video data through projection of corresponding picture signals onto the retina 51 of the eye 5 of the user of the communications terminal 4. The video data are, for example, still or moving pictures of transmitted television programs or reproduced, stored video sequences, pictures, or graphics, that are obtained from, or respectively supplied by, the central unit 2 or another video source 6 connected to the communications terminal 4 via a video interface with contacts, for instance a television receiver, a video playback device, for example a video cassette recorder, or a reproduction device for digital video data stored on data carriers.

A video display device 41, which can project picture signals directly onto the retina 51 of a viewer, a so-called virtual retinal display device (Virtual Retinal Display, VRD) has been described in the patent applications WO 94/09472 and WO 97/37339. These virtual retinal display devices can be supplied with video data via a video interface, for instance in the form of an RGB signal, an NTSC signal, a VGA signal or another formatted color or monochrome video or graphics signal. One skilled in the art will understand that it can be advantageous to adapt the virtual retinal display device described in the mentioned patent publications WO 94/09472 and WO 97/37339, or the video interface described there, in such a way that it is also able to receive efficiently other formats of television signals and in particular digital video data. By means of an interface module (not shown), television signals and video data can also be suitably adapted to the video interface, or respectively obtained video data can be converted such that they are able to be applied to the video interface.

The video display device 41 and the further components of the communications terminal 41 can be implemented in a common or separate housings, the video display device 41 being connected in a first housing via a wired or via a wireless interface to components in the second housing, for instance.

As shown schematically in Figure 1, the video display device 41 includes an eye position tracking module 411, which determines current eye positions of the user when viewing video data and is able to transmit them, via the above-mentioned, or an additional, wired or wireless interface, to a feedback module 42 of the communications terminal 4. An eye position tracking module (eye tracker) which determines current eye positions based on the position of the pupil 52 of a user, has also been described in the above-mentioned patent application WO 94/09472, and can be extended by one skilled in the art such that the determined eye position is available for components outside the video display device 41 via a suitable interface; depending upon the embodiment, values for both eyes can be made available.

The feedback module 42 of the communications terminal 4, for example a programmed software module that is executed on a processor of the communications terminal 4, transmits determined current eye positions of the user, if applicable together with other viewing data, to an evaluation unit, for instance a programmed software module in the communications terminal 4, or in particular with the aid of communications services of the communications terminal 4, over the telecommunications network 3 to the central unit 2. In the central unit 2, the transmitted viewing data with the current eye positions are received by the communications module 21 and are sent to the processing module 23.

Depending upon the embodiment variant and application, the communications terminal 4 includes further modules 43, 44, 45, 46 which contribute data to the viewing data.

The time determining module 43 determines the current time, and transmits the determined current time to the feedback module 42, from where it is transmitted to the central unit 2 together with the determined current eye positions in the viewing data. Besides establishing the point in time of the determined eye positions, the time indication can also be used to identify the

video data viewed at this point in time, for instance if the television channel watched at this point in time is known.

The input module 44 makes it possible for a user to enter user data and to transmit these data to the central unit 2, by means of the feedback module 42, together with the viewing data or separately. User data are, for example, qualitative data, e.g. a number from an evaluation scale or instructions or responses, which are transmitted to the central unit 2. The input module 44 includes, for example, operating elements and correspondingly programmed software functions which are able to receive user data entered by means of the operating elements. The input module, however, can also be a programmed software module which transmits determined current eye positions to the central unit 2 as user data, for instance at specified times or in response to predefined signals or instructions which are transmitted from the video source 6 or the central unit 2 to the communications terminal 4, or, in the function of the above-mentioned evaluation unit, compares determined current eye positions with predefined position values or with position values that are transmitted from the video source 6 or the central unit 2 to the communications terminal 4, and, on the basis of this comparison, carries out operations corresponding to the position values, initiates actions, and/or transmits instructions, responses or evaluations as user data to the central unit 2. The comparison operation can also be carried out in the central unit 2, which will be explained more closely later. Such an input module 44 therefore makes it possible to use the virtual retinal display device 41, or respectively the communications terminal 4 with the virtual retinal display 41, as graphic user interface, which can be controlled by the user through positioning his eyes in that, by means of the virtual retinal display device, GUI objects (Graphical User Interface), corresponding to the position values, in the picture regions are projected onto the retina of the user. Corresponding video data for such a graphic user interface can also be transmitted, for instance, by the central unit 2 to the communications terminal 4.

The identification module 45, for example an SIM card (Subscriber Identification Module) contains user identification data, for example an IMSI (International Mobile Subscriber Identity) and/or a personal biometric code, or key, which can be transmitted to the central unit 2 by the feedback module 42 together with other viewing data. This is especially useful when viewing data are further processed or evaluated in the central unit 2 on an individual user

level, or when, in the central unit 2, additional user-specific data, for instance name and address information from a subscriber database, are brought in for further processing of the viewing data.

5 The video identification module 46, for example a programmed software module, determines video identification data for current video data, for instance the relevant television channel, the title of a video with the current sequence number of the current video frame or other indications, and passes on the determined video identification data to the feedback module 42 for transmission to the central unit 2 with other viewing data.

10 Through the processing module 23 of the central unit 2, for example a programmed software module, the received viewing data are evaluated and/or stored in a viewing database 24. An immediate evaluation of the received viewing data in the processing module 23 makes sense especially when predefined actions are supposed to be triggered on the basis of the current eye
15 positions contained therein. For example, the communications terminal 4 with the virtual retinal display device 41 can be used, as mentioned above, as graphic user interface that is controlled by the user through eye positioning. In this way eye positions corresponding to a predefined picture region of the reproduced video data can trigger actions in the central unit 2. For example, a
20 products and/or services ordering method can be initiated by the processing module 23, or information, in particular video data, can be transmitted via the telecommunications network 3 to the communications terminal 4 for reproduction via the display device 41, whereby in particular GUI applications of the client/server type can also be achieved. Stored viewing data can also be
25 evaluated statistically, for instance at a later point in time. For example, which and how many viewers have viewed, or respectively have not viewed, particular picture regions of reproduced video data can be studied, which can be of interest for the evaluation of advertising films, for instance. In a further variant, in evaluating the eye positions, the processing module 23 can also take into
30 account identified picture objects contained in the video data, so that the correlation of the eye positions with these identified objects can be studied. To carry out this last variant, it can be advantageous, for example, to analyze respective video data in advance with suitable image processing means such that their pictorial content can be described in abstract form, for instance
35 through object designations, vectors and/or data on coordinates. Such abstract

content descriptions can be stored in the database 24, for instance together with the respective video data, and can be supplied to the processing module 23. Captured viewing data can also be stored, for instance user-specifically, as a user profile, and made further use of.

5 It should be explicitly stated here that, in the device 4, the virtual retinal display device 41 together with the input module 44 in the function of an evaluation unit can be used as GUI user interface without data having to be exchanged thereby with the central unit 2, which has the advantage that the device 4 can be controlled without use of other operating elements or the
10 hands of a user, which can also be of interest in particular for non-communication-capable computers.

Complete devices 4, as described, in particular communications terminals 4, can be sold or leased to an interested user. It can also be of commercial interest to sell expansion sets that include the necessary
15 components to extend a conventional device, in particular a conventional communications terminal, into a described device 4, in particular a described communications terminal 4, which expansion sets also include in particular a data carrier with programmed feedback module 42, programmed input module 44, programmed video identification module 46 stored thereon and, if
20 applicable, a time determining module 43. Whole systems can also be offered under license to interested operators, or data carriers can be sold to them containing a programmed communications module 21, processing module 23, and, if applicable, a viewing database 24 to operate a conventional communications server, which includes the hardware components needed by
25 the communications module 21, as the described central unit 2.

Claims

1. A method for capturing and processing viewing data, which viewing data relate to the viewing behavior of users when viewing video data and which viewing data are transmitted via a telecommunications network (3) to a central unit (2), where they are further processed, wherein

the video data are projected directly on the retina (51) of the user by means of a virtual retinal display device (41),

during projecting of the video data, data about lines of sight of the user relative to the viewed video data are determined by determining current eye positions of the user by means of an eye position detection module (411) of the display device (41), and

the viewing data are transmitted to the central unit (2) with at least the data on the lines of sight.

2. The method according to claim 1, wherein the current eye positions are compared with predefined values, and predefined actions are triggered on the basis of the result of this comparison.

3. The method according to one of the claims 1 or 2, wherein the viewing data are stored in the said central unit (2).

4. The method according to one of the claims 1 to 3, wherein the viewing data include user identification data.

5. The method according to one of the claims 1 to 4, wherein the viewing data include video identification data.

6. The method according to one of the claims 1 to 5, wherein the viewing data include time indications.

7. The method according to one of the claims 1 to 6, wherein the telecommunications network (3) is a mobile radio network.

8. A device (4) for capturing and processing viewing data, which viewing data relate to the viewing behavior of users when viewing video data, which video data are reproduced by means of a display device (41) of the device (4), the device (4) including a feedback module (42), which feedback module (42)

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transmits the viewing data to an evaluation unit (2, 44), wherein

the display device (41) is a virtual retinal display device which projects the video data directly on the retina (51) of the user,

the virtual retinal display device (41) includes an eye position detection
5 module (411), which, during projection of the video data, determines data on lines of sight of the user relative to the viewed video information by determining current eye positions of the user, and

the feedback module (42) is set up such that it transmits the viewing data to the evaluation unit (2, 44) at least with the data on the lines of sight.

10 9. The device (4) according to claim 8, wherein the feedback module (43) is set up such that it transmits the viewing data via a telecommunications network (3) to a central unit (2).

10. The device (4) according to one of the claims 8 or 9, wherein the device (4) includes means (44) of comparing the current eye positions with
15 predefined values, and of triggering predefined actions on the basis of the result of this comparison.

11. The device (4) according to one of the claims 8 to 10, wherein the device (4) includes an identification module (45), assigned to the user, with user identification data, and the viewing data include the user identification
20 data.

12. The device (4) according to one of the claims 8 to 11, wherein the device (4) includes a video identification module (46), which video identification module (46) determines video identification data associated with the video data, and the viewing data include the video identification data.

25 13. The device (4) according to one of the claims 8 to 12, wherein the device (4) includes a time determining module (43) which determines the current time, and the viewing data include time indications.

14. The device (4) according to one of the claims 19 <sic. 9> to 13, wherein the device (4) is designed as a mobile device, and the
30 telecommunications network (3) is a mobile radio network via which mobile radio network (3) the device (4) is able to communicate.

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09926774-121801

List of Reference Numerals

- 1 system
- 2 center
- 3 telecommunications network (mobile radio network)
- 4 device (communications terminal, mobile device)
- 5 eye
- 6 video source
- 21 communications module
- 23 processing module
- 24 database (viewing database)
- 41 video display device (virtual retinal display device)
- 42 feedback module
- 43 time determining module
- 44 input module
- 45 identification module (SIM card)
- 46 video identification module
- 51 retina
- 52 pupil
- 411 eye position detection module

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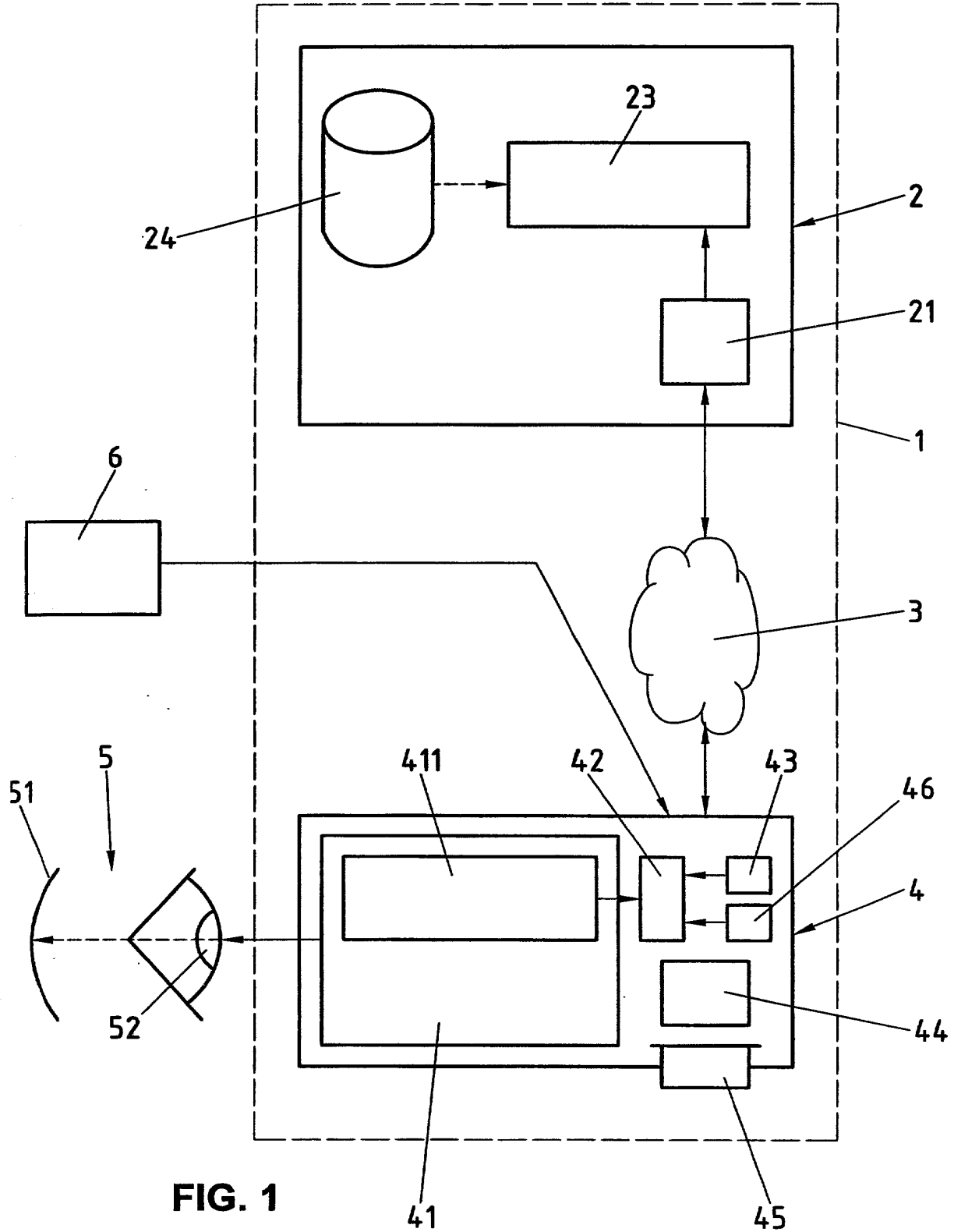


FIG. 1

Declaration and Power of Attorney For Patent Application

Erklärung Für Patentanmeldungen Mit Vollmacht

German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

deren Beschreibung

(zutreffendes ankreuzen)

☐ hier beigefügt ist.

☐ am _____ unter der

Anmeldungsseriennummer _____

eingereicht wurde und am _____
abgeändert wurde (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Method, Device and System for Capturing
and Processing Viewing Data

the specification of which

(check one)

☒ is attached hereto.

☒ was filed on 18 June 1999 as

Application Serial No. PCT/CH 99/00268

and was amended on _____
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

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Ich beanspruche hiermit ausländische Prioritätsvorteile gemäß Title 35, US-Code, § 119 (a)-(d), bzw. § 365(b) aller unten aufgeführten Auslandsanmeldungen für Patente oder Erfinderurkunden, oder § 365(a) aller PCT internationalen Anmeldungen, welche wenigstens ein Land ausser den Vereinigten Staaten von Amerika benennen, und habe nachstehend durch ankreuzen sämtliche Auslandsanmeldungen für Patente bzw. Erfinderurkunden oder PCT internationale Anmeldungen angegeben, deren Anmeldetag dem der Anmeldung, für welche Priorität beansprucht wird, vorangeht.

Prior Foreign Applications
(Frühere ausländische Anmeldungen)

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Ich beanspruche hiermit die mir unter Title 35, US-Code, § 120 zustehenden Vorteile aller unten aufgeführten US-Patentanmeldungen bzw. § 365(c) aller PCT internationalen Anmeldungen, welche die Vereinigten Staaten von Amerika benennen, und erkenne, insofern der Gegenstand eines jeden früheren Anspruchs dieser Patentanmeldung nicht in einer US-Patentanmeldung, bzw. PCT internationalen Anmeldung in in einer gemäß dem ersten Absatz von Title 35, US-Code, § 112 vorgeschriebenen Art und Weise offenbart wurde, meine Pflicht zur Offenbarung jeglicher Informationen an, die zur Prüfung der Patentfähigkeit in Einklang mit Title 37, Code of Federal Regulations, § 1.56 von Belang sind und die im Zeitraum zwischen dem Anmeldetag der früheren Patentanmeldung und dem nationalen oder im Rahmen des Vertrags über die Zusammenarbeit auf dem Gebiet des Patentwesens (PCT) gültigen internationalen Anmeldetags bekannt geworden sind.

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Ich erkläre hiermit, daß alle in der vorliegenden Erklärung von mir gemachten Angaben nach bestem Wissen und Gewissen der Wahrheit entsprechen, und ferner daß ich diese eidesstattliche Erklärung in Kenntnis dessen ablege, daß wissentlich und vorsätzlich falsche Angaben oder dergleichen gemäß § 1001, Title 18 des US-Code strafbar sind und mit Geldstrafe und/oder Gefängnis bestraft werden können und daß derartige wissentlich und vorsätzlich falsche Angaben die Rechtswirksamkeit der vorliegenden Patentanmeldung oder eines aufgrund deren erteilten Patentes gefährden können.

I hereby claim foreign priority under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Priority Not Claimed
Priorität nicht beansprucht

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I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

German Language Declaration

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POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

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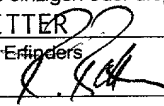

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(Supply similar information and signature for third and subsequent joint inventors.)